

sessile or subsessile, similar to the middle stem leaves, and gradually smaller apically on the stem; fewer capitula; an obconic-oblong involucre with the bracts in six rows; ovate outer bracts that are apically pubescent with an acute to obtuse apex; elliptic middle phyllaries that are apically sparsely pubescent with an obtuse apex; narrowly linear-elliptic inner bracts with a sparsely villous margin and an obconic-oblong apex; floccose-lanate anther tails; a biseriate pappus; and exterior setae that are shorter than the interior ones.

2. *Saussurea sugongii* S. W. Liu & T. N. Ho, sp. nov. TYPE: China. Xizang: Baingoin, S side of Muztagae mtn. pass, in gravel zone on high mtns., 5200 m, 19 Aug. 1988, S. G. Wu 2725 (holotype, KUN; isotype, MO). Figure 1E–G.

Haec species *Saussureae glaciali* Herder et *S. gnaphalodi* (Royle) Sch. Bip. affinis, sed a hac phyllariis purpureis glabris, ab illa foliis basalibus obovatis suborbiculatis spatulatis vel flabellatis, supra glabris, subtus dense albotomentosis, ab ambabus setis pappi 1-seriatis flavido-brunneolis recedit.

Perennials, 1.5–2 cm tall; rhizomes slender, dark brown to blackish; stems short, base covered with remains of old leaf petioles. Leaves basal and cauline, crowded into a rosette; petioles of upper leaves slender and long, leaf blades orbicular, reduced to 1–2 mm diam.; petioles of upper leaves ca. 1 × 0.4 cm, purple, glabrous, base vaginate-amplexicaul, leaf blades ovate, flabelliform, spatulate to suborbicular, 3–6 × 2–5 mm, apex rounded and dentate, margin entire, base cuneate and narrowed, adaxially glabrous, abaxially densely white tomentose. Capitula 3 to 6, sessile, crowded into a hemispheric shape, 1–2 cm diam., surrounded by rosulate leaves; involucre narrowly campanulate, 3–6 × 3–4 mm; involucre bracts purple, membranous, glabrous, apex acuminate and dentate, arranged in 2 or 3 rows; exterior bracts narrowly elliptic, to 2 mm wide, broader than interior bracts, narrowed at both ends; interior bracts narrowly elliptic, sometimes narrowly oblanceolate; receptacle naked. Florets tubular, 6–8 mm, purple, tube as long as limb. Achenes (immature) glabrous; pappus uniseriate, with setae as long as florets, pale yellow-brown, plumose, arranged in one row.

Distribution and habitat. *Saussurea sugongii* is known only from the type collection and is endemic to the Kunlun Mountains in Xizang, China. It occurs in gravelly soils at elevations between 4950 and 5400 m.

IUCN Red List category. Due to the rarity and limited distribution of *Saussurea sugongii*, this species is assessed here as Endangered (EN) according to the IUCN Red List criteria EN Blab(i,ii,iii) (IUCN, 2001).

Etymology. This new species is named in honor of Wu Su-gong, a phytotaxonomist and phytogeographer at the Kunming Institute of Botany, Chinese Academy of Sciences.

Relationships. *Saussurea sugongii* is similar to *S. glacialis* Herder and *S. gnaphalodes* (Royle) Sch. Bip., but differs from both by its uniseriate pappus with pale yellow-brown setae and by lacking a receptacular palea. *Saussurea sugongii* is distinguished from *S. glacialis* by its broader leaves that are obovate, flabelliform, spatulate, or suborbicular, adaxially glabrous, abaxially densely white tomentose, and with a rounded and dentate leaf apex. *Saussurea sugongii* is distinguished from *S. gnaphalodes* by its purple, glabrous involucre bracts. *Saussurea glacialis* is characterized by narrower leaves that are linear-spatulate, adaxially pubescent, and abaxially glabrous, with a white pappus arranged in two rows. *Saussurea gnaphalodes* is characterized by leaves that are oblong or narrowly spatulate, with both blade surfaces pale gray or yellow-brown pubescent; the upper leaves and involucre bracts that are abaxially black pubescent; and the pappus that is black or rarely dark brown and arranged in two rows.

Paratypes. CHINA. **Xinjiang:** Ruoqiang, N side of Muztagae mtn. pass, in gravel zone on high mtns., 5400 m, 19 Aug. 1988, S. G. Wu 2248 (KUN, MO), 4950 m, 19 Aug. 1988, S. G. Wu 2249 (KUN, MO).

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Literature Cited

- IUCN. 2001. IUCN Red List Categories and Criteria, Version 3.1. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland, and Cambridge, United Kingdom.
- Shih, C. & S. Y. Jin. 1999. *Saussurea* DC. Pp. 1–243 in Y. L. Chen & C. Shih (editors), *Flora Reipublicae Popularis Sinicae*, Vol. 78(2): Compositae (8), Cynareae. Science Press, Beijing.

A New Species of *Polygala* (Polygalaceae) from Southern Brazil

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ABSTRACT. A new species is recognized here as part of the taxonomic revision of the Polygalaceae in southern Brazil. *Polygala densiracemosa* Lüdtke & Miotto belongs to *Polygala* L. subg. *Polygala*, which comprises around 88 species and 22 varieties in Brazil, being the best represented subgenus of *Polygala* in the Brazilian flora. *Polygala densiracemosa* can be confused with *P. campestris* Gardner and *P. linoidea* Poir. by the resemblance of the flowers, fruits, and seeds and by the similar geographical distribution. However, *P. densiracemosa* is distinguished by a generally caespitose habit and dense racemes. The new species is described and illustrated, observations on habitat and distribution are provided, and differences among related taxa are discussed.

RESUMO. Uma nova espécie é reconhecida aqui como parte da revisão taxonômica da família Polygalaceae na região sul do Brasil. *Polygala densiracemosa* Lüdtke & Miotto pertence ao *Polygala* L. subg. *Polygala* que compreende cerca de 88 espécies e 22 variedades, constituindo-se no subgênero de *Polygala* melhor representado na flora brasileira. *Polygala densiracemosa* pode ser confundida com *P. campestris* Gardner e *P. linoidea* Poir. na semelhança das flores, frutos, sementes e na distribuição geográfica. Entretanto, *P. densiracemosa* apresenta hábito geralmente cespitoso e racemos muito densos. São fornecidos descrição, ilustração, observações sobre os habitats e distribuição desta nova espécie, além disso, são discutidas as diferenças entre os táxons relacionados.

Key words: Brazil, IUCN Red List, *Polygala*, Polygalaceae, Rio Grande do Sul, subgenus *Polygala*.

The Polygalaceae are represented by 19 genera with approximately 1000 species widely distributed, especially in tropical regions, with an abundant distribution in Central and South America, Africa, and Asia (Paiva, 1998). In Brazil, the family encompasses seven genera: *Barnhartia* Gleason,

Bredemeyera Willd., *Diclidanthera* Mart., *Monnina* Ruiz & Pav., *Moutabea* Aubl., *Polygala* L., and *Securidaca* L., totaling approximately 240 species (Marques, 1979).

Polygala is the largest genus of the Polygalaceae, comprising about 725 species worldwide (Paiva, 1998). In the Brazilian flora, the genus *Polygala* is well represented by 110 species and 30 varieties (Marques & Peixoto, 2007) and can be distinguished from other Polygalaceae by the dehiscent, 2-seeded capsule.

Previous taxonomic reviews of the Polygalaceae or the genus *Polygala* in Brazil include those of Wurdack and Smith (1971), Marques (1984a, b, 1988), Silva (2001), Lüdtke and Miotto (2004), Marques and Peixoto (2007), and Aguiar et al. (2008). During the current taxonomic revision of the family in southern Brazil (Paraná, Santa Catarina, and Rio Grande do Sul states), 40 species of *Polygala* were recognized, with one newly described here.

***Polygala densiracemosa* Lüdtke & Miotto, sp. nov.**

TYPE: Brazil. Rio Grande do Sul: Campestre da Serra, BR 116, Km 63, 3 Nov. 2003, R. Lüdtke 193 (holotype, ICN). Figure 1.

Haec species praecipue et racemis pedunculatis cylindricis valde prope ad *Polygalam campestris* Gardner, sed ab ea habitu caespitoso, racemis densioribus, bracteis eciliatis, floribus albis minoribus (2–2.5 mm longis) et carinae crista 6-loba differt.

Herbs decumbent or caespitose, eglandular, 11–45 cm high; stems quadrangular, glabrate or poorly pilose, with short trichomes. Leaves abundant, sessile, alternate, papyraceous, glabrous or rarely pilose, ovate, elliptic, or oblong, 2–11 × 2–5 mm, apex mucronate, apiculate, or acuminate, base attenuate, margins entire and smooth; bracts deciduous, lanceolate, subulate, 1–1.8 mm, margins smooth; bracteoles deciduous, ovate, margins smooth. Racemes densely congested, pedunculate, terminal, cylindrical, 3–

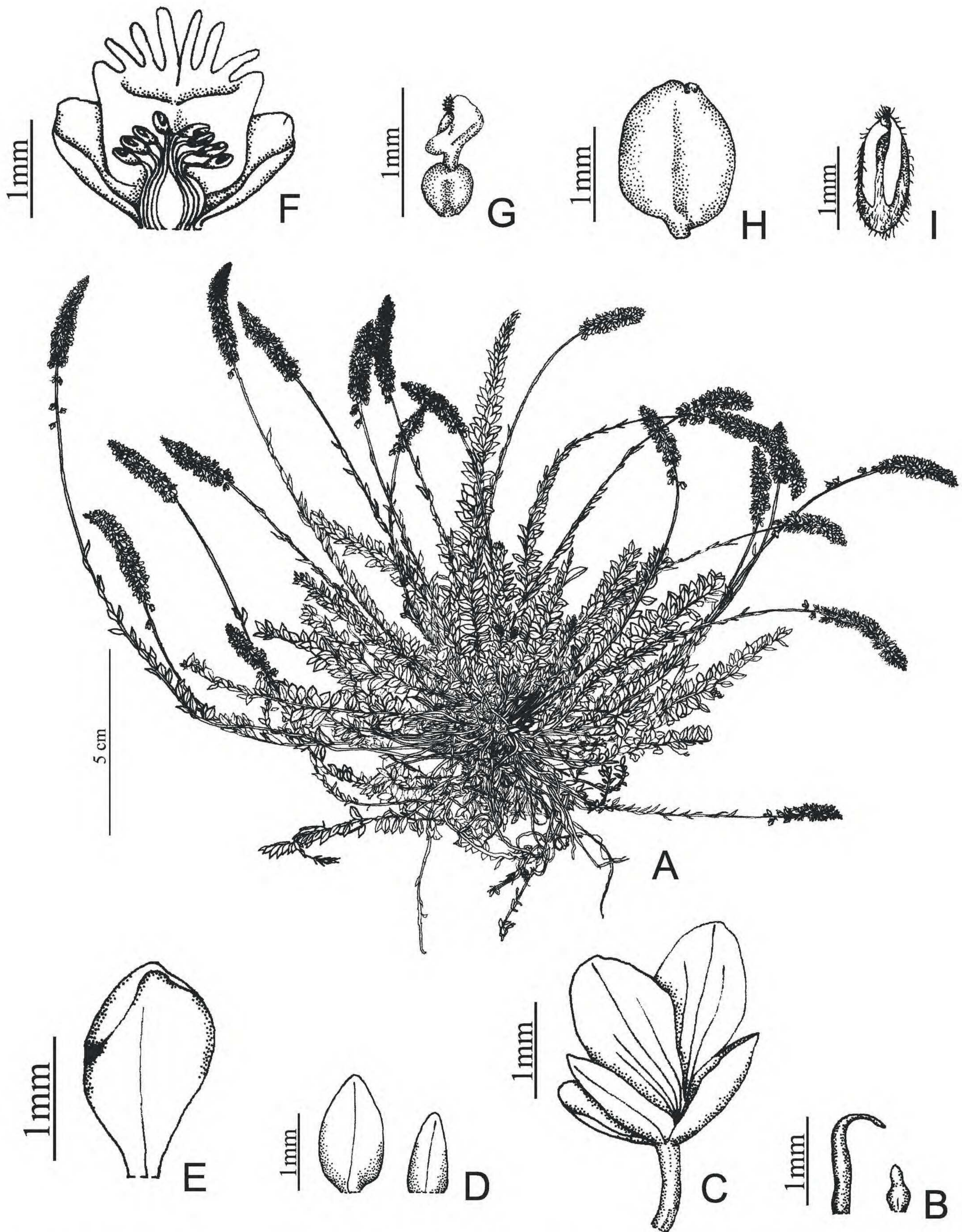


Figure 1. *Polygala densiracemosa* Lüdtke & Miotto. —A. Habit. —B. Bract and bracteole. —C. Calyx in lateral view. —D. External sepals. —E. Internal sepal. —F. Longitudinal sections of corolla and androecium. —G. Gynoecium in longitudinal view. —H. Capsule. —I. Seed. Drawn from the holotype, *R. Lüdtke 193* (ICN).

12 cm; pedicels to 1 mm, glabrous, reflexed or pendulous in fruit. Flowers 2–2.5 mm, white with purple or blue spots; external sepals unequal, inserted at the same point, glabrous, apex acute or obtuse, margins entire; 1 sepal widely ovate, 1.2–1.3 mm, 2

sepals elliptic or ovate, 1–1.2 mm; internal sepals glabrous, spatulate or elliptic, 2–2.6 mm, apex rounded, base attenuate; lateral petals glabrous, elliptic, 1.5–2 mm, apex rounded, keel crested, crest 0.8–1 mm, with 6 lobes simple or bifid; ovary

glabrous, suborbicular or widely elliptic in outline. Capsule glabrous, suborbicular or widely elliptic in outline, 1.1–2 mm, stipitate, not winged; seeds finely pubescent, elliptic in outline, 1.2–1.8 mm, with membranous appendage totally bilobed, ca. 1/5 to equal to the seed in length.

Distribution and habitat. *Polygala densiracemosa* has been collected in southern Brazil, in the states of Santa Catarina and Rio Grande do Sul, from fields and roadsides, in dry soils.

IUCN Red List category. *Polygala densiracemosa* is assessed as Near Threatened (NT) according to IUCN Red List criteria (2001) due to habitat degradation by human activities, such as fire settings for pasture renovation and silvicultural expansion over natural areas of southern Brazilian grasslands. Our fieldwork estimates a current total population of less than 500 mature individuals for the new species.

Phenology. Plants were observed with flowers and fruit occurring from October to December.

Etymology. The Latin epithet refers to the densely congested racemes, which are a diagnostic feature of this species.

Discussion. *Polygala densiracemosa* is included in subgenus *Polygala* L., which is recognized by the flowers with a crested keel. This subgenus is represented by approximately 88 species and 22 varieties in the Brazilian flora (Marques, 1988).

Polygala densiracemosa was initially identified in herbarium collections as *P. campestris* Gardner, due to their resemblance in habit and a similar geographical distribution, with both occurring in high fields in the states of Santa Catarina and Rio Grande do Sul. However, *P. densiracemosa* is generally caespitose and presents densely congested racemes, whereas *P. campestris* has a prostrate habit and the racemes are lax. The two species also differ in the margin of the bracts, which is glabrous in *P. densiracemosa* and ciliate in *P. campestris*; the flowers, which are smaller (2–2.5 mm) and white in *P. densiracemosa* and blue or purple and larger (3–4.3 mm) in *P. campestris*; and the crest of the keel, which has six simple or bifid lobes in *P. densiracemosa* and eight to 12 lobes in *P. campestris*. Another species similar to *P. densiracemosa* is *P. linoides* Poir. These two species are similar in the length of the floral whorls, but in *P. linoides* the habit is erect and the leaves are scantily distributed, while in *P. densiracemosa* the leaves are more abundant. Although both species occur in high fields, *P. linoides* is found in wetlands and bogs, while *P. densiracemosa* occurs only in dry fields and roadsides and is also found at lower altitudes.

Paratypes. BRAZIL. **Rio Grande do Sul:** Almirante Tamandaré do Sul, BR 386, Km 160, 28°10'34.3"S, 52°50'10.9"W, 9 Oct. 2006, R. Lüdtke 581 (ICN); Caçapava do Sul, 24 Nov. 1982, J. Matos & Rubem F. 24688 (HAS); Campestre da Serra, BR 116, Km 70, 3 Nov. 2003, R. Lüdtke 193 (ICN); Campestre da Serra, BR 116, Km 76, 28°46'13.2"S, 51°05'32.2"W, 5 Nov. 2007, R. Lüdtke 768 (ICN); Carazinho, Granja Pinheirinho, 2 Oct. 1971, J. C. Lindeman et al. s.n. (ICN 8214); Caseiros, BR 285, Km 232, 4 Nov. 2003, R. Lüdtke 199 (ICN); Cruz Alta, S de Cruz Alta, 2 Oct. 1971, J. C. Lindeman et al. s.n. (ICN 8239); Cruz Alta, BR 377, Km 94, 28°37'40.6"S, 53°27'41.7"W, 3 Oct. 2007, R. Trevisan 838 (ICN, MO); Esmeralda, 1 Oct. 1984, L. R. M. Baptista et al. s.n. (ICN 62681); Esmeralda, 27 Dec. 2002, R. Lüdtke 108 (ICN); Esmeralda, Estação Ecológica Aracuri, 7 Nov. 1982, S. T. S. Miotto & E. Franco s.n. (ICN 64908); Esmeralda, 12 Dec. 1982, S. T. S. Miotto s.n. (ICN 648751); Esmeralda, 8 Sep. 1983, S. M. Eisinger s.n. (ICN 94751); Fontoura Xavier, BR 386, 28°53'18.1"S, 52°25'05.3"W, 2 Oct. 2007, R. Trevisan 837 (ICN, MO); Jaquirana, 3 Nov. 2002, R. Lüdtke 34 (ICN), R. Lüdtke 40 (ICN); Jaquirana, 25 Nov. 2004, R. Lüdtke 302 (ICN); Jaquirana, a 36 km de Bom Jesus, 16 Oct. 2004, S. T. S. Miotto 2205 (ICN); Júlio de Castilhos, BR 158, 29°15'04.3"S, 53°39'54.1"W, 3 Oct. 2007, R. Trevisan 847 (ICN); São Francisco de Paula, 20 km ENE, 13 Nov. 1972, J. C. Lindeman et al. s.n. (ICN 20874); São Francisco de Paula, RS 020, 29°24.744'S, 50°28.289'W, 25 Nov. 2004, R. Lüdtke 288 (ICN); Vacaria, Ipê, 2 Nov. 1987, P. Backs s.n. (ICN 80386); Vacaria, BR 116, 28 Dec. 2002, R. Lüdtke 119 (ICN). **Santa Catarina:** Bom Jardim da Serra, a 5 km E da cidade, 25 Nov. 1980, A. Krapovickas y R. Vanni 36916 (CTES); Bom Jardim da Serra, SC 438, 19 Oct. 2004, R. Lüdtke 244 (ICN); Bom Jardim da Serra, beira da SC 438, 19 Oct. 2004, R. Lüdtke 247 (ICN); Painel, Km 35 da rodovia Lages–São Joaquim, 20 Oct. 2004, R. Lüdtke 264 (ICN); Painel, SC 438, Km 15, 27°52'23.2"S, 50°10'44.6"W, 6 Nov. 2007, R. Lüdtke 781 (ICN); São Joaquim, Km 52 da rodovia Lages–São Joaquim, entrada da Fazenda Bela Vista, 20 Oct. 2004, R. Lüdtke 266 (ICN).

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Literature Cited

- Aguiar, A. C. A., M. C. M. Marques & K. Yamamoto. 2008. Taxonomia das espécies de *Polygala* L. subgênero *Hebeclada* (Chodat) Blake (Polygalaceae) ocorrentes no Brasil. *Revista Brasil. Bioci.* 6: 81–109.
- IUCN. 2001. IUCN Red List Categories and Criteria, Version 3.1. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland, and Cambridge, United Kingdom.
- Lüdtke, R. & S. T. S. Miotto. 2004. O gênero *Polygala* L. (Polygalaceae) no Rio Grande do Sul, Brasil. *Revista Brasil. Bioci.* 2(2): 49–102.
- Marques, M. C. M. 1979. Revisão das espécies do gênero *Polygala* L. (Polygalaceae) do Estado do Rio de Janeiro. *Rodriguésia* 31(48): 69–339.
- . 1984a. Polígala do Brasil—I. Seção *Acanthocladus* (Klotzsch ex Hassk.) Chodat (Polygalaceae). *Rodriguésia* 36(60): 3–10.